

We claim:

1. A method of operating a data communication apparatus comprising:

at each of a plurality of service specific transceivers:

receiving a plurality of input signals from a given plurality of data communications devices operating with a given data communication protocol;

aggregating each of said received plurality of input signals to result in a given service specific electrical signal;

transmitting said given service specific electrical signal to a wavelength access controller;

at said wavelength access controller:

receiving a plurality of service specific electrical signals from a plurality of service specific transceivers, at least two of said service specific transceivers operating with different data communication protocols;

converting said plurality of service specific electrical signals to a corresponding plurality of service specific optical signals;

wavelength division multiplexing said plurality of service specific optical signals to result in a wavelength division multiplexed signal; and

transmitting said wavelength division multiplexed signal over an optical conductor to an element of an optical transport network.

2. The method of claim 1 further comprising, at said wavelength access controller, classifying each of said plurality of service specific electrical signals.

1 3. The method of claim 1 further comprising maintaining, at said wavelength access
2 controller, a database of information relating to resources in said optical transport network.

1 4. The method of claim 2 wherein said resources comprise wavelength channels between
2 elements in said optical transport network.

1 5. The method of claim 3 further comprising

2 receiving a connection request from one of said plurality of service specific
3 transceivers;

4 determining, based on said information in said database, a path through said transport
5 network corresponding to said connection request; and

6 instructing said element of said optical transport network to set up said determined
7 path through said transport network..

1 6. The method of claim 1 further comprising, before said converting, including header
2 information in each of said plurality of service specific electrical signals.

1 7. Data communication apparatus, comprising:

2 a first transceiver for:

3 receiving a plurality of input signals from a first plurality of data
4 communications devices operating with a first data communication protocol;

5 aggregating each of said received plurality of input signals to result in a first
6 service specific electrical signal;

7 transmitting said first service specific electrical signal to a wavelength access
8 controller;

9 a wavelength access controller for:

10 receiving a plurality of service specific electrical signals from a plurality of
11 service specific transceivers, at least two of said service specific transceivers
12 operating with different data communication protocols;

13 converting said plurality of service specific electrical signals to a
14 corresponding plurality of service specific optical signals;
15 wavelength division multiplexing said plurality of service specific optical
16 signals to result in a wavelength division multiplexed signal; and
17 transmitting said wavelength division multiplexed signal over an optical
18 conductor to an element of an optical transport network.

1 8. Data communication apparatus, comprising:

2 a first transceiver comprising:

3 means for receiving a plurality of input signals from a first plurality of data
4 communications devices operating with a first data communication protocol;
5 means for aggregating each of said received plurality of input signals to result
6 in a first service specific electrical signal;
7 means for transmitting said first service specific electrical signal to a
8 wavelength access controller;

9 a wavelength access controller comprising:

10 means for receiving a plurality of service specific electrical signals from a
11 plurality of service specific transceivers, at least two of said service specific
12 transceivers operating with different data communication protocols;
13 means for converting said plurality of service specific electrical signals to a
14 corresponding plurality of service specific optical signals;
15 means for wavelength division multiplexing said plurality of service specific
16 optical signals to result in a wavelength division multiplexed signal; and
17 means for transmitting said wavelength division multiplexed signal over an
18 optical conductor to an element of an optical transport network.

1 9. A computer readable medium for providing program control for a wavelength access
2 controller in a wavelength access server, where said wavelength access server is
3 communicatively coupled to both a plurality of service specific data communications devices
4 and an element of an optical transport network, and said wavelength access controller is
5 communicatively coupled to a plurality of service specific transceivers, said computer
6 readable medium adapting said wavelength access controller to be operable to:

7 classify a service specific electrical signal from each of said plurality of service
8 specific transceivers;

9 maintain a database of information relating to resources in said optical transport
10 network;

11 receive a connection request, from one of said plurality of service specific
12 transceivers, for a path through said transport network;

13 determine, based on said information in said database, a path through said transport
14 network corresponding to said connection request; and

15 signal said element of said optical transport network to set up said determined path
16 through said transport network.

1 10. A method of operating a data communication apparatus comprising:

2 at a wavelength access controller:

3 receiving a wavelength division multiplexed signal over an optical conductor
4 from an element of an optical transport network;

5 wavelength division de-multiplexing said wavelength division multiplexed
6 signal to result in a plurality of service specific optical signals;

7 converting said plurality of service specific optical signals to a corresponding
8 plurality of service specific electrical signals;

9 determining which of a plurality of service specific transceivers correspond to
10 each of said plurality of service specific electrical signals;

transmitting each of said plurality of service specific electrical signals to a determined corresponding service specific transceiver;

at each of said plurality of service specific transceivers:

receiving a given service specific electrical signal from said wavelength access controller;

segmenting said given service specific electrical signal to result in a plurality of output signals; and

transmitting each of said plurality of output signals to a corresponding data communications device.

11. A data communication apparatus comprising:

a wavelength access controller comprising:

means for receiving a wavelength division multiplexed signal over an optical conductor from an element of an optical transport network;

means for wavelength division de-multiplexing said wavelength division multiplexed signal to result in a plurality of service specific optical signals;

means for converting said plurality of service specific optical signals to a corresponding plurality of service specific electrical signals;

means for determining which of a plurality of service specific transceivers correspond to each of said plurality of service specific electrical signals;

means for transmitting each of said plurality of service specific electrical signals to a determined corresponding service specific transceiver;

at each of said plurality of service specific transceivers:

means for receiving a given service specific electrical signal from said wavelength access controller;

16 means for segmenting said given service specific electrical signal to result in a
17 plurality of output signals; and

18 means for transmitting each of said plurality of output signals to a
19 corresponding data communications device.

1 12. A data communication apparatus comprising:

2 a wavelength access controller for:

3 receiving a wavelength division multiplexed signal over an optical conductor
4 from an element of an optical transport network;

5 wavelength division de-multiplexing said wavelength division multiplexed
6 signal to result in a plurality of service specific optical signals;

7 converting said plurality of service specific optical signals to a corresponding
8 plurality of service specific electrical signals;

9 determining which of a plurality of service specific transceivers correspond to
10 each of said plurality of service specific electrical signals;

11 transmitting each of said plurality of service specific electrical signals to a
12 determined corresponding service specific transceiver;

13 a service specific transceiver for:

14 receiving a given service specific electrical signal from said wavelength access
15 controller;

16 segmenting said given service specific electrical signal to result in a plurality
17 of output signals; and

18 transmitting each of said plurality of output signals to a corresponding data
19 communications device.

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